



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,534	07/24/2003	Tong Zhang	10018743	8212

22879 7590 03/08/2006

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

QIN, JIANCHUN

ART UNIT	PAPER NUMBER
----------	--------------

2837

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/625,534

Applicant(s)

ZHANG, TONG

Examiner

Jianchun Qin

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 10, 15-23, 27, 29-35, 38 and 40-42 is/are rejected.
- 7) ☒ Claim(s) 4-9, 11-14, 24-26, 28, 36, 37 and 39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/19/06 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 10, 34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman et al. (U.S. Pub. No. 20020147728) in view of Kane et al. (U.S. Pat. No. 5148484).

With respect to claim 1:

Goodman et al. teach a method for automatic classification of music, comprising: receiving a music piece to be classified (sections 0057 and 0060); determining when the

Art Unit: 2837

received music piece comprises human singing (sections 0053, 0057 and 0061); labeling the received music piece as singing music when the received music piece is determined to comprise human singing (sections 0024, 0055 and 0061); and labeling the received music piece as instrumental music when the received music piece is not determined to comprise human singing (sections 0024, 0055 and 0061).

Goodman et al. do not mention expressly: determine when the received music piece comprising a plurality of music components comprises human singing by analyzing a waveform of the music piece comprising a plurality of music components.

Kane et al. teach techniques for determining when a received music piece comprises human singing by analyzing a waveform of the music piece comprising a plurality of music components (Figs. 5(a)-5(c); Figs. 6(a)-6(e); col. 3, lines 9-19, lines 30-41; cols. 4-5, lines 58-15 and col. 5, lines 20-31).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Kane et al. into the invention of Goodman et al. in order to digitally classify a received music piece accurately and efficiently by using a simple and robust technique (Kane et al., col. 1, lines 28-37).

With respect to claim 2:

Goodman et al. also teach: the received music piece is comprised of at least music sounds, and wherein the music piece can include one or more of audiovisual signals and/or non-music sounds (section 0057, lines 5-7).

With respect to claim 34:

Goodman et al. teach a computer readable medium encoded with software for automatically classifying a music piece (see Abstract), wherein the software is provided for determining when a music piece comprises human singing (sections 0053, 0057 and 0061); labeling the music piece as singing music when the music piece is determined to comprise human singing (sections 0024, 0055 and 0061); and labeling the music piece as instrumental music when the music piece is not determined to comprise human singing (sections 0024, 0055 and 0061).

Goodman et al. do not mention expressly: determine when the received music piece comprises human singing by analyzing a waveform of the music piece comprising a plurality of music components.

Kane et al. teach techniques for determining when a received music piece comprises human singing by analyzing a waveform of the music piece comprising a plurality of music components (Figs. 5(a)-5(c); Figs. 6(a)-6(e); col. 3, lines 9-19, lines 30-41; cols. 4-5, lines 58-15 and col. 5, lines 20-31).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Kane et al. into the invention of Goodman et al. in order to digitally classify a received music piece accurately and efficiently by using a simple and robust technique (Kane et al., col. 1, lines 28-37).

With respect to claims 10 and 38:

Claims 10 and 38 recite an intended use of the method and system for classification of music taught by Goodman et al. It has been held that a recitation of the intended use of the claimed invention must result in a structural difference between the

claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

4. Claims 3 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman et al. (U.S. Pub. No. 20020147728) in view of Kane et al., as applied to claims 1 and 34 above, and further in view of Stewart (U.S. Pat. No. 4015087).

Goodman et al. and Kane et al. teach a method and computer software for classification of music that includes the subject matter discussed above in accordance with claims 1 and 34. Goodman et al. and Kane et al. do not mention expressly: a spectrogram analysis is used for said classification.

Stewart teaches a technique of spectrogram analysis for human speech recognition (col. 1, lines 13-16; cols. 1-2, lines 61-6; col. 10, lines 21-38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Stewart in the combination of Goodman et al. and Kane et al. in order to provide an algorithm for audio signal analysis based on spectral energy concentration of a portion of the audio signal in the time domain as well as in the frequency domain (Stewart, col. 2, lines 7-13).

5. Claims 15-18 and 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman et al. in view of Kane et al., as applied to claims 1 and 34 above, and further in view of Kanevsky et al. (U.S. Pat. No. 6434520).

Goodman et al. and Kane et al. teach a method and computer software for classification of music that includes the subject matter discussed above in accordance with claims 1 and 34. Goodman et al. further teach, regarding claim 17, the user selects a hierarchical structure of categories for controlling the classification of the music piece (section 0063).

Goodman et al. and Kane et al. do not mention expressly: regarding claims 15 and 40, the labeled music piece is written into a library of classified music pieces; regarding claims 16 and 41, the labeling and/or the writing of the labeled music piece is controlled by parameters selected by a user; and regarding claims 18 and 42, the labeled music piece is written into a hierarchical database according to the structure selected by the user and wherein the labeled music pieces in the hierarchical database can be browsed according to the hierarchy.

Kanevsky et al. disclose a system and method for indexing and querying audio archives, and teach the step and means of: when a music piece satisfies at least one selected category, writing the labeled music piece into a library of classified music pieces (col. 1, lines 54-56; col. 7, lines 21-39 and col. 8, lines 34-36); the labeling and/or the writing of the labeled music piece is controlled by parameters selected by a user (col. 7, lines 45-59); and the labeled music piece is written into a hierarchical database according to the structure selected by the user (col. 7, lines 45-67) and wherein the

labeled music pieces in the hierarchical database can be browsed according to the hierarchy (col. 9, lines 34-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Kanevsky et al. in the combination of Goodman et al. and Kane et al. to obtain a library of classified music piece for the purpose of efficient sorting and storing music pieces in their archives and facilitating subsequent retrieval of desired information (Kanevsky et al., col. 1, lines 28-39).

6. Claims 19-22, 27 and 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman et al. in view of Kane et al. and Kanevsky et al. (U.S. Pat. No. 6434520).

With respect to independent claim 19:

Goodman et al. teach a method for classification of music (see Abstract), comprising: selecting parameters for controlling the classification of a music piece comprising a plurality of music components, wherein the selected parameters establish a hierarchy of categories for classifying the music piece (section 0024, 0049, 0053 and 0060); determining, in a hierarchical order and for each selected category, when the music piece satisfies the category (section 0024, 0049, 0053 and 0060); labeling the music piece with each selected category satisfied by the music piece (section 0024, 0049, 0053 and 0060).

Goodman et al. do not mention expressly: using waveform analysis to determining when the music piece satisfies the category; and when the music piece

satisfies at least one selected category, writing the labeled music piece into a library according to a hierarchy of the categories satisfied by the music piece.

Kane et al. teach techniques for determining when a received music piece comprises human singing by analyzing a waveform of the music piece comprising a plurality of music components (Figs. 5(a)-5(c); Figs. 6(a)-6(e); col. 3, lines 9-19, lines 30-41; cols. 4-5, lines 58-15 and col. 5, lines 20-31).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Kane et al. into the invention of Goodman et al. in order to digitally classify a received music piece accurately and efficiently by using a simple and robust technique (Kane et al., col. 1, lines 28-37).

Kanevsky et al. disclose a system and method for indexing and querying audio archives, and teach the step and means of, when a music piece satisfies at least one selected category, writing the labeled music piece into a library according to a hierarchy of the categories satisfied by the music piece (col. 1, lines 54-56; col. 7, lines 21-39 and col. 8, lines 34-36).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Kanevsky et al. in the invention of Goodman et al. to obtain the invention as specified in claim 19 in order to efficiently sort and store music pieces in their archives and to facilitate subsequent retrieval of desired information (Kanevsky et al., col. 1, lines 28-39).

With respect to claims 20 and 21:

Goodman et al., Kane et al. and Kanevsky et al. teach a method for classification of music that includes the subject matter discussed above in accordance with claim 19. Goodman et al. further teach, the categories include instrumental, singing music, symphony, a specific band, specific instrument music, other harmonic music, chorus, and vocal solo (section 0057).

Kanevsky et al. further teach: selecting parameters for subsequent browsing of the library for desired music pieces (col. 9, lines 34-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Kanevsky et al. in the invention of Goodman et al. and Kane et al. in order to efficiently sort and store music pieces in their archives and to facilitate subsequent retrieval of desired information (Kanevsky et al., col. 1, lines 28-39).

With respect to independent claims 22 and 31:

Goodman et al. teach a computer-based system for automatic classification of music (see Abstract), comprising: a computer configured to determine when the received music piece comprises human singing (sections 0053, 0057 and 0061); label the received music piece as singing music when the received music piece is determined to comprise human singing (sections 0024, 0055 and 0061); label the received music piece as instrumental music when the received music piece is not determined to comprise human singing (sections 0024, 0055 and 0061).

Goodman et al. do not mention expressly: a device configured to receive a music piece to be classified; using waveform analysis to determine when the received music

Art Unit: 2837

piece comprising a plurality of music components comprises human singing; write the labeled music piece into a library of classified music pieces.

Kane et al. teach techniques for determining when a received music piece comprises human singing by analyzing a waveform of the music piece comprising a plurality of music components (Figs. 5(a)-5(c); Figs. 6(a)-6(e); col. 3, lines 9-19, lines 30-41; cols. 4-5, lines 58-15 and col. 5, lines 20-31).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Kane et al. into the invention of Goodman et al. in order to digitally classify a received music piece accurately and efficiently by using a simple and robust technique (Kane et al., col. 1, lines 28-37).

Kanevsky et al. teach: a device configured to receive a music piece to be classified (Fig. 2A, #200); and write the labeled music piece into a library of classified music pieces (Fig. 2B, #213; col. 8, lines 34-36).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Kanevsky et al. in the invention of Goodman et al. to obtain a library of classified music pieces for the purpose of efficiently sorting and storing music pieces in their archives to facilitate subsequent retrieval of desired information (Kanevsky et al., col. 1, lines 28-39).

With respect to claim 27:

Claim 27 recites an intended use of the method and system for classification of music taught by Goodman et al. It has been held that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed

Art Unit: 2837

invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

With respect to claims 29, 30, 32 and 33:

Goodman et al., Kane et al. and Kanevsky et al. teach a method and system for classification of music that includes the subject matter discussed above in accordance with claims 22 and 31. Goodman et al. further teach: regarding claim 30, an interface configured to select parameters for controlling the classification of the music (section 0063); regarding claims 32 and 33, means for labeling the classified music piece as a particular category of music (sections 0024, 0055 and 0061), and means for selecting control parameters to control, adjust, and/or customize the classifying of the music piece (section 0063).

Kanevsky et al. further teach, regarding claim 29, that the labeling and/or the writing of the labeled music piece is controlled by parameters selected by a user (col. 7, lines 45-59).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Kanevsky et al. in the invention of Goodman et al. and Kane et al. in order to efficiently sort and store music pieces in their archives and to facilitate subsequent retrieval of desired information (Kanevsky et al., col. 1, lines 28-39).

7. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goodman et al. in view of Kane et al. and Kanevsky et al., as applied to claim 22 above, and further in view of Stewart.

Goodman et al., Kane et al. and Kanevsky et al. teach a method for classification of music that includes the subject matter discussed above.

The combination of Goodman et al., Kane et al. and Kanevsky et al. does not mention expressly: the presence of human singing on the received music piece is determined by analyzing a spectrogram of the received music piece.

Stewart teaches a technique of spectrogram analysis for human speech recognition (col. 1, lines 13-16; cols. 1-2, lines 61-6; col. 10, lines 21-38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Stewart in the combination of Goodman et al. and Kane et al. in order to provide an algorithm for audio signal analysis based on spectral energy concentration of a portion of the audio signal in the time domain as well as in the frequency domain (Stewart, col. 2, lines 7-13).

Allowable Subject Matter

8. Claims 4-9, 11-14, 24-26, 28, 36, 37 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

9. The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claims 4 and 24 is the inclusion of the limitation of classifying the labeled singing music piece as either chorus music or solo music, based on frequency vibrations in the singing music piece. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 5-9, 25, 26, 36 and 37 is the inclusion of the limitation of classifying the labeled singing music piece as either chorus music or solo music, based on spectral peak tracks in the singing music piece. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 11 is the inclusion of the limitation that the symphony features include repetition, contrast, and variation of music signal or energy over time; sonata-allegro form; binary form; rondo form; regularities in movements; and alternating high and low volume intervals. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

The primary reason for the allowance of claim 12 is the inclusion of the limitation of comparing the symphony music piece against one or more music segments

exemplary of a specific band, wherein the symphony music piece is labeled as a specific band music piece if the symphony music piece matches at least one exemplary music segment. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

The primary reason for the allowance of claims 13 and 14 is the inclusion of the limitation of: when the instrumental music piece has not been labeled as symphony, comprising: segmenting the instrumental music piece into notes by detecting note onsets; detecting harmonic partials for each segmented note, wherein if note onsets cannot be detected in most notes of the music piece and/or harmonic partials cannot be detected in most notes of the music piece, then labeling the instrumental music piece as other instrumental music. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 28 and 39 is the inclusion of the limitation that the labeled instrumental music piece is analyzed for occurrences of features indicative of symphonies, and wherein if at least one symphony feature is detected in the instrumental music piece, the instrumental music piece is labeled as symphony. It is this limitation found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

Response to Arguments

10. Applicant's arguments received 01/19/06 with respect to claims 1-42 have been considered but are moot in view of the new ground(s) of rejection.

Claims 1-3, 10, 15-23, 27, 29-35, 38 and 40-42 are rejected as new prior art references (U.S. Pat. No. 5148484 to Kane et al., U.S. Pat. No. 4015087 to Stewart) have been found to teach the limitations argued by the Applicant. Detailed response is given in sections 3-7 as set forth above in this Office Action.

Contact Information

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jianchun Qin whose telephone number is (571) 272-5981. The examiner can normally be reached on 8am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula Bradley can be reached on (571) 272-2001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/625,534
Art Unit: 2837

Page 16

Jianchun Qin
Examiner
Art Unit 2837

JQ
March 3, 2006



JEFFREY DONELS
PRIMARY EXAMINER